APPENDIX 1: RANGELAND HEALTH EVALUATION MATRIX

The Rangeland Health Evaluation Matrix was taken directly from pages 130 and 131 of the January 1994 report entitled Rangeland Health: New Methods to Classify, Inventory and Monitor Rangelands, published by the National Research Council. The matrix represents three phases of evaluation recommended by the committee. It is designed to be an evaluation tool that involves simple, often visual measurements.

Based upon limited field testing, there are a couple of important points to be remembered when using the matrix.

The first point is that soil stability and watershed function are the most important criteria when measuring rangeland health. These two factors should have greater weight than other criteria. Soil movement off site probably means that the rangeland is unhealthy.

The second point is that the precise boundary between the categories of healthy, at risk, and unhealthy is not clear. Placement of an area into one of these categories will require judgement, and there will be borderline cases that are difficult to place. There is good scientific understanding of how to use soil surface characteristics as indicators of soil stability. However, the scientific understanding needed to develop and interpret measurable indicators of changes in nutrient cycling, energy flow, and recovery mechanisms is less will developed (National Research Council 1994).

RANGELAND HEALTH EVALUATION MATRIX			
Indicator	**Healthy**	**At Risk**	**Unhealthy**
Soil Stability and Watershed Function			
Soil A horizon	Present and unfragmented	Present, but fragmented distribution developing	Absent, or present only in association with prominent plants or other obstructions
Pedestalling	None	Pedestals present, but on mature plants only. No roots exposed	Most plants and rocks pedestalled, roots exposed
Rills and gullies	Absent or with blunted or muted features	Small, embryonic, and not connected into a dendritic pattern	Well defined, actively expanding, dendritic pattern established
Scouring or sheet erosion	None visible	Patches of bare soil or scours developing	Bare areas and scours well developed and contiguous

Sedimentation or dunes	No visible soil deposition	Soil accumulating around plants or small obstructions	Soil accumulating in large barren deposits or dunes, or behind large obstructions
Distribution of Nutrient Cycling and Energy Flow			
Distribution of plants	Plants well distributed across site	Plant distribution becoming fragmented	Plants clumped, often in association with prominent individuals, large bare areas between clumps
Litter distribution and incorporation	Uniform across site	Becoming associated with prominent plants or other obstructions	Litter largely absent
Root distribution	Community structure results in rooting throughout available soil profile	Roots are absent from portions of the available soil profile	Roots only present in one portion of the available soil profile
Distribution of photosynthesis	Photosynthetic activity occurs throughout the period suitable for plant growth	Most photosynthetic activity occurs during one portion of plant growth period	Little or no photosynthetic activity on location during most of the period suitable for plant growth
Recovery Mechanisms			
Age-class distribution	Distribution reflects all species and age classes	Seedlings and young plants missing	Primarily old or deteriorating plants present
Plant vigor	Plants display normal growth form	Plants developing abnormal growth form	Most plants in abnormal growth form
Germination	Microsites suitable for germination present and well distributed	Developing crusts, soil movement or other factors degrading microsites; crusts are fragile	Soil movement or crusting sufficient to inhibit most germination and seedling establishment

Source: National Research Council, 1994.

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